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unsettled condition of this group of plants it must be exceedingly difficult for a philosophical mind to feel satisfied in their study, and this is apparently exactly Prof. Tuckerman's position. The ordinary multiplier of species would meet with no difficulty, but would reap a rich harvest among the bewildering display of forms; but our author has no such thought and with evident reluctance sends out the present book with its species, "in great part, sufficiently well settled." All through the work one finds new things described,but not as yet admitted to specific rank, and having only provisional places. These, we are told, the author would have preferred to keep back, "with Horace, *nonum in annum*." We are thankful however that he did not in this case follow literally the precepts of the genial poet, for this work will enable more of us to help the author in fixing the uncertain forms. There is usually no loss in putting out a tentative work, for observers are never so provoked into reporting their observations as when they think they are correcting blunders. Our author also thinks that Lichenology has not kept pace with the "diagnostic enumeration of new forms called arbitrarily species;" which same may be said of some other groups of plants. As students of Phænogamic Botany are in the habit of looking to Robert Brown as the most philosophical observer, so the students of Lichens look with equal veneration upon Elias Fries.

In some 20 pages of introduction Prof. Tuckerman gives a capital view of the present status of our knowledge concerning lichens. This is followed by a list of recent authors and a key to the 72 genera, grouped under the two series, *Gymnocarpi*, and *Angiocarpi*, names that remind us of our series of Dicotyledons. Then follows the body of the work, containing quite a full description of characters, localities, and relations of the species. Our copy happened to be faulty, lacking pages 257–260 and thus depriving us of two or three small genera; nor could we find *Thamnolia* in the index, although it appears in the body of the work.

Nearly 500 species are described, the largest genus being *Lecanora*, numbering 56 species. The other large genera are *Cladonia* with 35 species, *Parmelia* 30, *Placodium* 28, *Collema* 27, *Leptogium* 25, *Pannaria* 24, *Cetraria* 22, and *Physcia* and *Sticta* each 21. This shows remarkable uniformity in the size of the genera; but in the other genera the number of species drops very rapidly into the single digits.

It is to be hoped and expected that one of the results of this book will be the more earnest study of this puzzling group of plants, which very fact will hasten the reading of many riddles. There is no reason now why Lichens should not have as many devotees as most other groups of Cryptogamia.—J. M. C.

Action of Acids on Cellulose.—"Acids (especially sulphuric acid) *when greatly diluted** cause starch grains and cellulose at the ordinary temperature to swell up much more violently than pure water, without however destroying their organization."—Sachs' Text-book of Botany, Bennett & Dyers' Trans., p. 592.

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*Italics mine. L. S.

Accompanying the above statement, Sachs gives a figure of the bast-fibers from the leaf of *Hoya carnosa* as they appear after treatment with suphuric acid and iodine. All my attempts to obtain these appearances with "greatly diluted" sulphuric acid having failed, I repeated the experiment using acid (C. P.) of known strength. No perceptible effect was produced by the application to different specimens ofdilutions containing 20, 30, 40 or 50 per cent. of acid. Sixty per cent. acid however produced the extraordinary swelling as figured by Sachs. Similar experiments were tried with the bast-fibers from the leaves of *Yucca aloifolia* and *Latonia Borbonica* with similar results. It seems to me that 60 p. c. acid can hardly be said to be "greatly diluted."

Can any one explain the discrepancy?—Lizzie Shoemaker, *Botanical Laboratory, Purdue University, LaFayette, Ind.*

A Bit of Fern History.—In reviewing the history of some of our rare ferns during the past ten years, it is interesting to note the changes which have occurred in their comparative scarcity and abundance.

Ten years ago *Botrychium simplex* was so great a rarity that one might almost despair of ever obtaining a specimen; now it is plentiful enough, obtainable with little or no difficulty, and seldom called for in exchange. In Massachusetts it had not been collected for many years, when E. S. Wheeler detected it in Berlin, in 1878. Since then it has only been recorded twice—both times from Essex Co.—and is still rare in the State where it was originally discovered by Rev. Edward Hitchcock, in 1822. When E. S. Miller found it on Long Island, N. Y., in 1873, those who were able to secure specimens from him, regarded themselves as fortunate indeed. But in 1877 Mrs. Chas. Barnes, of Syracuse, found it so plentiful in the North Woods that she was able to supply many demands for it, while in the same year Mr. Pringle found it equally plentiful in Vermont. Since then it has continued to turn up at intervals in different localities from Maine to California, until probably no one who has made any effort to make up a collection of North American Ferns is without a specimen.

The writer recalls the pleasurable emotions with which he first received imperfect specimens of *Asplenium myriophyllum* and *Cheilanthes Lindheimeri*, at that time desiderata so rare as seemingly to be placed beyond reach. The first of these was received from Dr. Chapman himself—the specimen being the last of the original collection made by him twenty years before, a fact which enhanced its value greatly—and the writer still remembers how eagerly some friends received, and how much they prized the precious bits which he ventured to detach from his specimen to share with them. But